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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,885	01/26/2004	Kazushige Umetsu	U 015005-9	9704

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LADAS & PARRY  
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New York, NY 10023

EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 10/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/764,885

Applicant(s)

UMETSU ET AL.

Examiner

Michael Aboagye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 28-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/26/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 10/273,422.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/26/2004</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 28-32, 34 and 36-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koide et al. (US Patent No. 5,670,067) in view of Amako et al. (US Patent No. 6,031,201)

Koide et al. discloses an apparatus for cutting an electrical wiring line, comprising a laser generator for generating a laser beam (abstract, figures 1 and 11); a beam expander ("46" figure 11) for adjusting the beam diameter; an optical beam branching

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element ("48A, 82, 92 and 94", figure 11 and column 4, lines 1-48) for branching the laser beam generated by the laser generator into a plurality of branch beams; an IC mounter which mounts the IC on the substrate (figure 1); a slit to allow a passage of the laser beam; a projecting lens; an optical shutter to allow the passage of the beam for predetermined time period; and a scanning means for scanning and directing the beam onto the wiring to be cut (column 5, lines 22-47); wherein the plurality of electrical wiring lines which are shorted to each other are cut by the branch beams for isolation from each other and then connected with the IC( column 1, lines 15-23, column 2, lines 1-29)

Koide et al. does not expressly teach a beam condenser, a phase grating element, a polarizing beam splitter or a laser diode oscillator.

However Amako et al. teaches a laser machining apparatus comprising laser generator is a laser diode oscillator (column 25, lines 25-30); an optical beam branching element for branching the laser beam generated by the laser generator into a plurality of branch beams, and a beam condenser ("1110" figure 1; column 14, lines 33-44) for condensing the branch beams branched by the optical beam branching element; wherein the optical beam branching element also serves as the beam condenser (figure 1 & 15, column 15, lines 28-34); wherein the optical branching element is one of an optical diffraction element and a phase grating (column 14, lines 38-40, column 16, lines 10-13, column 17, lines 55-58 and "1109", figure 1); a beam expander for adjusting the beam diameter of the beam prior to beam condensation ("1105a and 1105b", figure 1); further comprising a beam splitter element for splitting the laser beam generated by the laser generator into a plurality of beams, wherein the optical beam branching element is

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arranged at least for one split beam; wherein the beam splitter element is a polarizing beam splitter(column 17, lines 48-50; "5101", figure 22); wherein said laser machining arrangement allows simultaneous processing of a plurality of surface area of an object at a time , and also allows great improvement in machining capability (Amako et al., column 3, lines 44-52)

Amako et al. laser machining arrangement shows the optical beam branching element and the beam condenser in a unit piece of system hence said elements are considered to be incorporated in the IC mounter (figures 1 and 26).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have modified the laser apparatus of Koide et al. by including beam branching element namely a beam condenser, a phase grating element, a polarizing beam splitter as taught by Amako et al. in order to enhance the machining capabilities of the laser system and also allow simultaneous processing of a plurality of surface areas of an object at a time (Amako et al., column 3, lines 44-52).

4. Claim 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koide et al. (US Patent No. 5,670,067) in view of Amako et al. (US Patent No. 6,031,201) as applied to claims 28 and 32 above and further in view of Zanoni (US Patent No. 3,984,153).

Koide at al. in view of Amako et al. disclose and/or suggest the elements of claims 28 and 32, but fail to teach disposing a retardation element in the optical system.

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However Zandoni discloses an apparatus for transforming a single laser beam into two parallel beams comprising a laser diode ("1", figure 1) polarization beam splitter ("3", figure 1, and column 3, lines 1-10) for splitting the laser beam into two output beams ("4" and "5", figure 1) a retarder or a retardation element (column 3, lines 19-21) disposed in the optical path, converts the linearly polarized light to a circularly polarized beam and also adjust the relative intensity of the two beams so that the two output beam have equal intensity and therefore have equal energy (Zandoni, column 3, lines 20-25); wherein said energy equalization provides system stability.

It would have been obvious to one of ordinary skill in the art to have disposed in the optical path of the laser system of Koide et al. as modified by Amako et al., a retardation element as taught by Zandoni to ensure intensity and energy equalization among the two output beams and consequently provides system stability (Zandoni, column 3, lines 20-25).

5. Claim 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koide et al. (US Patent No. 5,670,067) in view of Amako et al. (US Patent No. 6,031,201) as applied to claims 28 and 32 above and further in view of Liu et al., (US Patent. No. 6,580,054).

Koide et al. in view of Amako et al. disclose and/or suggest the elements of claim 28, but fail to teach a suction mechanism for sucking debris resulting from the cutting process.

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However, Liu et al. teaches a laser machining system having a laser diode oscillator as the laser generating source ("10", figure 1, and column, 4, lines 21-25); a pick and placed robot for mounter (column 3, lines 3-14); and a gas removing system ("16", figure 1) with a gas exhaust system and a vacuum ("17", figure 1) to remove debris generated by the ablation of the sapphire substrate (column, 3, lines 44-46; and column 4, lines 30-37), wherein said debris is removed to prevent contamination to the integrated devices (Liu et al., column 2, lines 61-63).

It would have been obvious to one of ordinary skill in the art to provide in the apparatus of Koide et al. as modified by Amako et al. a debris removing means as taught by Liu et al. in order to prevent contamination to the integrated devices (Liu et al., column 2, lines 61-63).

### ***Conclusion***


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Amako et al. (US Pub. 2002/0021723), Siu (US 6,181,431), Terada et al. (US 6,563,082), and Hayashi et al. (US 5,498,851) are also cited in PTO-892.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
AM

  
Michael Aboagye  
Assistant Examiner  
Art unit 1725

10/11/2006

KEVIN KERNS  
PRIMARY EXAMINER

 10/11/06